

CLAIMS

1. A light source device comprising, at least, a primary light source, a light guide that guides light emitted from said primary light source and has a light incident surface on which the light emitted from said primary light source is incident, and a light outgoing surface from which the guided light exits, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and located so as to face said light outgoing surface, and a light exit surface on an opposite side relative to said light entrance surface, and a light diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side relative to said incident surface,

wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a shape of each of said virtual elongated prisms as a reference, and said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution is 1 to 13 degrees when parallel light is incident thereon.

2. A light source device according to claim 1, wherein a haze value of said light diffuser is 8 to 82%.

3. A light source device according to claim 1 or 2, wherein an average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 12 degrees.

4. A light source device comprising, at least, a primary light source, a light guide that guides light emitted from said primary light source and has a light incident surface on which the light emitted from said primary light source is incident, and a light outgoing surface from which the guided light exits, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and located so as to face said light outgoing surface, and a light exit surface on an opposite side relative to said light entrance surface, and a light diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side relative to said incident surface,

wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a

shape of each of said virtual elongated prisms as a reference, and a haze value of said light diffuser is 8 to 82%.

5        5. A light source device according to claim 4, wherein said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution is 1 to 13 degrees when parallel light is incident thereon.

10       6. A light source device according to claim 4 or 5, wherein an average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 12 degrees.

15       7. A light source device comprising, at least, a primary light source, a light guide that guides light emitted from said primary light source and has a light incident surface on which the light emitted from said primary light source is incident, and a light outgoing surface from which the guided light exits, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and located so as to face said light outgoing surface, and a light exit surface  
20       on an opposite side relative to said light entrance surface, and a light diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side relative to said incident surface,

25       wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section

wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a shape of each of said virtual elongated prisms as a reference, and an average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 12 degrees.

8. A light source device according to claim 7, wherein said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution is 1 to 13 degrees when parallel light is incident thereon.

9. A light source device according to claim 7 or 8, wherein a haze value of said light diffuser is 8 to 82%.

10. A light source device according to any one of claims 1, 5, and 8, wherein a developed length of said light guide is 8cm or less, and said light diffuser is configured in such a manner that the full width half maximum of the outgoing light luminous intensity distribution is 1 to 6 degrees when the parallel light is incident thereon.

11. A light source device according to any one of claims 2, 4, and 9, wherein a developed length of said light guide is 8cm or less, and the haze value of said light diffuser is 8 to 60%.

12. A light source device according to any one of claims 3, 6, and 7, wherein a developed length of said light guide is 8cm or less, and the

average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 5 degrees.

13. A light source device according to any one of claims 1, 5, and 8, wherein a developed length of said light guide is greater than 8cm and equal to or less than 23cm, and said light diffuser is configured in such a manner that the full width half maximum of the outgoing light luminous intensity distribution is 3 to 11 degrees when the parallel light is incident thereon.

14. A light source device according to any one of claims 2, 4, and 9, wherein a developed length of said light guide is greater than 8cm and equal to or less than 23cm, and the haze value of said light diffuser is 30 to 80%.

15. A light source device according to any one of claims 3, 6, and 7, wherein a developed length of said light guide is greater than 8cm and equal to or less than 23cm, and the average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 3 to 9.5 degrees.

16. A light source device comprising, at least, a primary light source, a light guide that guides light emitted from said primary light source and has a light incident surface on which the light emitted from said primary light source is incident, and a light outgoing surface from which the guided light exits, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and located so as to face said light outgoing surface, and a light exit surface on an opposite side relative to said light entrance surface, and a light

diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side relative to said incident surface,

5                wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section  
10 wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a  
15 shape of each of said virtual elongated prisms as a reference, a full width half maximum of a luminance distribution of outgoing light from the light exit surface of said light deflector is 19 to 26 degrees, and said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution is 1 to 8 degrees when  
20 parallel light is incident thereon.

17. A light source device according to claim 16, wherein a haze value of said light diffuser is 8 to 70%.

25                18. A light source device according to claim 16 or 17, wherein an average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 7 degrees.

19. A light source device comprising, at least, two primary light

sources, a light guide that guides lights emitted from said primary light sources and has two light incident surfaces on which the lights emitted from said two primary light sources are respectively incident and which are disposed on opposite sides to each other, and a light outgoing surface from which the guided lights exit, said light guide having a developed length greater than 8cm and equal to or less than 28cm, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and located so as to face said light outgoing surface, and a light exit surface on an opposite side relative to said light entrance surface, and a light diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side relative to said incident surface,

wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a shape of each of said virtual elongated prisms as a reference, and said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution is 0.7 to 13 degrees when parallel light is incident thereon.

20. A light source device according to any one of claims 1, 2, 4,

5, 7, 8, 16, 17, and 19, wherein an average inclination angle of the incident surface of said light diffuser is greater than an average inclination angle of the outgoing surface thereof.

5           21. A light source device according to any one of claims 1, 2, 4, 5, 7, 8, 16, 17, and 19, wherein the incident surface and the outgoing surface of said light diffuser have a convex-concave structure.

10           22. A light source device comprising, at least, a primary light source, a light guide that guides light emitted from said primary light source and has a light incident surface on which the light emitted from said primary light source is incident, and a light outgoing surface from which the guided light exits, a light deflector having a light entrance surface disposed adjacent to the light outgoing surface of said light guide and  
15           located so as to face said light outgoing surface, and a light exit surface on an opposite side relative to said light entrance surface, and a light diffuser having an incident surface disposed adjacent to the light exit surface of said light deflector and located so as to face the light exit surface of said light deflector, and an outgoing surface on an opposite side  
20           relative to said incident surface,

          wherein said light diffuser is configured in such a manner that a full width half maximum of an outgoing light luminous intensity distribution has an anisotropy when parallel light is incident thereon.

25           23. A light source device according to claim 22, wherein said light diffuser is configured in such a manner that a maximum full width half maximum of the outgoing light luminous intensity distribution is 1 to 13 degrees when the parallel light is incident thereon.



24. A light source device according to claim 22 or 23, wherein said light diffuser is configured in such a manner that a maximum full width half maximum of the outgoing light luminous intensity distribution is 1.1 times a minimum full width half maximum thereof or greater when the parallel light is incident thereon.

25. A light source device according to any one of claims 22 to 24, wherein a haze value of said light diffuser is 8 to 82%.

26. A light source device according to any one of claims 22 to 25, wherein an average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser has an anisotropy.

27. A light source device according to claim 25, wherein a maximum average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 15 degrees.

28. A light source device according to claim 23, wherein a developed length of said light guide is 8cm or less, and said light diffuser is configured in such a manner that the maximum full width half maximum of the outgoing light luminous intensity distribution is 1 to 6 degrees when the parallel light is incident thereon.

29. A light source device according to any one of claims 22, 23, and 28, wherein a developed length of said light guide is 8cm or less, and a haze value of said light diffuser is 8 to 60%.

30. A light source device according to any one of claims 22, 23, and 28, wherein a developed length of said light guide is 8cm or less, and a

maximum average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 0.8 to 5 degrees.

31. A light source device according to claim 23, wherein a  
5 developed length of said light guide is greater than 8cm and equal to or less than 23cm, and said light diffuser is configured in such a manner that the maximum full width half maximum of the outgoing light luminous intensity distribution is 3 to 13 degrees when the parallel light is incident thereon.

10 32. A light source device according to any one of claims 22, 23, and 31, wherein a developed length of said light guide is greater than 8cm and equal to or less than 23cm, and a haze value of said light diffuser is 30 to 80%.

15 33. A light source device according to any one of claims 22, 23, and 31, wherein a developed length of said light guide is greater than 8cm and equal to or less than 23cm, and a maximum average inclination angle of at least one of the incident surface and the outgoing surface of said light diffuser is 3 to 15 degrees.

20 34. A light source device according to any one of claims 22, 23, 28, and 31, wherein a maximum average inclination angle of the incident surface of said light diffuser is greater than a maximum average inclination angle of the outgoing surface thereof.

25 35. A light source device according to claim 34, wherein the maximum average inclination angle of the incident surface of said light diffuser is 1.1 times a minimum average inclination angle thereof or greater.

36. A light source device according to any one of claims 22, 23, 28, and 31, wherein a plurality of elongated prisms arrayed side by side are formed at the light entrance surface of said light deflector, each of said elongated prisms has two prism surfaces and, assuming a plurality of virtual  
5 elongated prisms arrayed at the same pitch as that of the elongated prisms of said light deflector and each having a triangular shape in section wherein peak light in a distribution of outgoing light from the light outgoing surface of said light guide is incident on one of virtual prism surfaces and totally internally reflected by the other virtual prism surface  
10 to exit from said light exit surface in a desired direction, at least one of said prism surfaces is formed into a convex curved surface shape using a shape of each of said virtual elongated prisms as a reference.